

CHANGE MANAGER for DB2*

New Solutions for DB2 Change Management

Power and flexibility

The hotly competitive, ever-changing environment of business today dictated the need for a DBMS with the power and flexibility to meet the information processing demands of a dynamic organization. DB2 has won wide acceptance by fulfilling these requirements. However, the benefits of DB2's flexibility are somewhat undermined by its size and complexity.

Most organizations that have implemented DB2 rely on multiple DB2 subsystems to facilitate the design, development, test and production stages of an application's life cycle. The data independence offered by DB2 allows the application data structures in each of these subsystems to vary for any given application. These variations in structural elements are required to satisfy issues regarding performance, security and additional uses of data from one subsystem to another. Applications may also exist at different version levels on different subsystems. All of these factors make the task of database administration much more complex and error-prone than with previous DBMS systems, such as IMS.

Time for a change

Studies show that approximately 70% of the application life cycle is devoted to maintenance. These mod-

ifications to the application will likely have an impact on the DB2 data structures that support the application. Implementing changes to data structures managed by DB2 in today's complex environment can be a challenge for even the most experienced DBA. Trends such as:

- increasing numbers of DB2 applications
- more mission-critical applications
- continuous availability
- increasingly complex data structures
- distributed DB2 environments
- proliferation of CASE tools

are adding to the issues that must be considered by a DBA to accomplish even the smallest application change. The strengths of DB2--data independence and flexibility--frustrate efforts to make implementing changes to DB2 structures a manageable process. The challenge faced by DB2 DBAs is to maximize the power of DB2's capabilities while keeping control of data structures and facilitating the responsive implementation of changes.

Solve DBA problems

BMC Software has been solving the problems associated with DB2 database administration since its introduction of ALTER™ for DB2* in 1987, which pioneered the automa-

tion of the change process for DB2. ALTER's milestone technology has become the standard against which similar tools are now measured. ALTER satisfies the requirements for implementing changes within a single DB2 subsystem and also provides the ability to migrate DB2 structures and data to different DB2 subsystems. However, the technology embodied in ALTER, as well as in other similar products, does not address the complete set of requirements for managing change within a complex DB2 environment comprising multiple subsystems as well as CASE tools and various other repositories for structure definitions.

In such complex DB2 environments, changes must be implemented while structure modifications that have been made locally for tuning, data access or security purposes are preserved. CASE tools and other repositories used for application design must be synchronized with DB2's implementation of data structures.

BMC Software has continued to listen to DBAs to determine the requirements for a complete, comprehensive solution to the problem of change management for DB2. Input from current ALTER users and other experienced DBAs has been refined to form a concise set of requirements for managing changes to DB2 application data structures.

BMC SOFTWARE

The Experience. The Technology. The Future.

BMC Software, Inc. • P.O. Box 2002 • Sugar Land, Texas 77487 • 1 800 841-2031

*DB2 is a registered trademark of International Business Machines Corp.

DB2 change management

An automated solution to the problem of managing changes to DB2 structures should meet the following requirements:

- Change Implementation
- Structure Migration
- Change Migration
- Change Feedback
- Change Recovery
- Change Audit

Change Implementation should provide a process to change the definition of any DB2 object while preserving or converting data, preserving dependent structures and propagating changes to dependent structures.

Structure Migration should generate CREATE SQL DDL commands from the sending subsystem and apply those CREATE SQL DDL commands at the receiving subsystem allowing modifications to take place at the receiver. It also must be possible to move data from the sender to the receiver.

Change Migration should provide the ability to identify changes made at the sending or control subsystem since the last version was sent to the receiver. These changes need to be analyzed for feasibility at the receiving subsystem and the changes must be applied while preserving or converting data, preserving dependent structures, propagating changes to dependent structures and preserving local modifications to structures.

Change Feedback should provide a mechanism to identify and capture local changes that have been made to structures that need to be reflected in the control subsystem. These changes then need to be applied at the control subsystem while satisfying all of the requirements for Change Migration.

Change Recovery should provide a method of capturing structure definitions and data that can be

used to fall back to a previous version of the structure in the event of an unsuccessful change. The fall-back process must allow current data to be converted to the old structure as well as the ability to use the captured version of the old data.

Change Audit should provide the ability to capture structure definitions at different points in time. From these captured definitions it must be possible to determine when and by whom all structure changes have been made during a given period of time.

ALTER satisfies the first two requirements, Change Implementation and Structure Migration. BMC Software is building upon the foundation of this technology to provide a complete and comprehensive solution for the four remaining requirements. **CHANGE MANAGER** for DB2* is BMC's answer for DB2 DBAs who need a tool to ease the complex, time-consuming, error-prone task of managing changes to DB2 data structures.

BMC's solution

CHANGE MANAGER will provide the ability to migrate and implement changes to DB2 structures instead of recreating the entire structure. This preserves any local modifications that may have been implemented on the receiving DB2 subsystem. Changes, called Change Specifications, are derived by analyzing versions of application structures captured by CHANGE MANAGER or structures defined by other means, such as SQL DDL statements, CASE tools or the DB2 catalog. These are then transmitted to the receiving DB2 subsystem where CHANGE MANAGER will ensure proper implementation.

CHANGE MANAGER will provide change feedback by generating Change Specifications for local modifications that can be transmitted back to the controlling DB2 subsystem. The Change Specifications are implement-

ed by CHANGE MANAGER at the controlling DB2 subsystem, synchronizing the data structure definitions.

Sites that use the Bachman Information Technology, Inc. CASE product DB2/DBA as their control point for structure definitions will have the advantage of sharing Change Specifications between CHANGE MANAGER and the BACHMAN tool. BMC and BACHMAN have agreed to jointly develop an interface that will allow the same Change Specifications to be processed by both tools. This allows BACHMAN's DB2/DBA repository to migrate changes to DB2 subsystems and allows CHANGE MANAGER to feed-back local changes to the BACHMAN repository to keep the DB2 structure implementation in sync with the BACHMAN DB2/DBA repository.

Additionally, CHANGE MANAGER will provide a method to capture structure definitions and data at any application version level. These captured versions may be used to recover from an application change that is unsuccessful. Recovery can be achieved either with current data that will be converted to the old structure or with old data that was captured by CHANGE MANAGER. BMC's high-speed DB2 utilities UNLOAD PLUS and LOADPLUS™ are used to efficiently unload, load and convert the data.

Finally, CHANGE MANAGER will allow captured versions of DB2 structures to be analyzed to determine the changes that have been made during the interval of time between the two versions. This will provide DBAs with an accurate record of DB2 change activity without regard to the mechanism used to accomplish the change.

BMC Software's CHANGE MANAGER represents a breakthrough in the technology available to administer DB2. With it, it will be possible to safely respond to DB2 application changes in a timely manner, capitalizing on the power and flexibility of DB2.

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In this book,
IBM
is giving you some information
about the
BACHMAN[®]
DB2[®] Product Set

Why?

Because...

...BACHMAN can help you exploit the power of DB2 and realize the promise of AD/Cycle — without losing your investment in existing systems.

BACHMAN and DB2

As the DB2 manual says, DB2 offers flexibility and power. That's why MIS shops are looking to it as the solution to their database problems. But the ability to build and maintain a good database design isn't shipped with DB2. It has to be learned. The best DBAs know that the DB2 Optimizer makes their job easier and harder, because they must understand its behavior to create DB2 designs that perform.

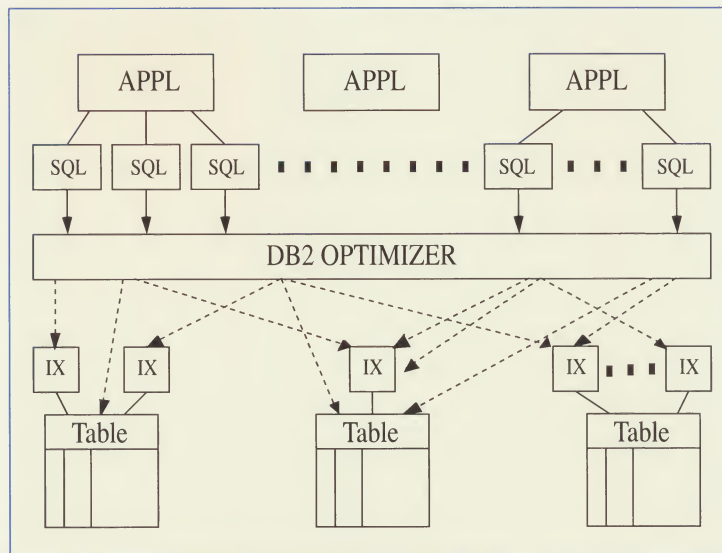
Experienced DBAs are in short supply. With IBM actively extending DB2 it can be hard to keep up. Hard to know which rules of thumb are still useful. Hard to look at all the details in a complex design. Hard, if you're new to database design, to know where to start.

The problem is compounded by the pressure to build new DB2 applications and at the same time to migrate — from flat

files, from IMS, or from other database systems such as IDMS. From "designs" that might be decades old, to new, optimal relational DB2 designs. And the database designs you build today need to serve past, present, and future applications.

BACHMAN
can help you
with these
challenges.

The DBA must provide the optimizer with a design that can be used effectively with any SQL.

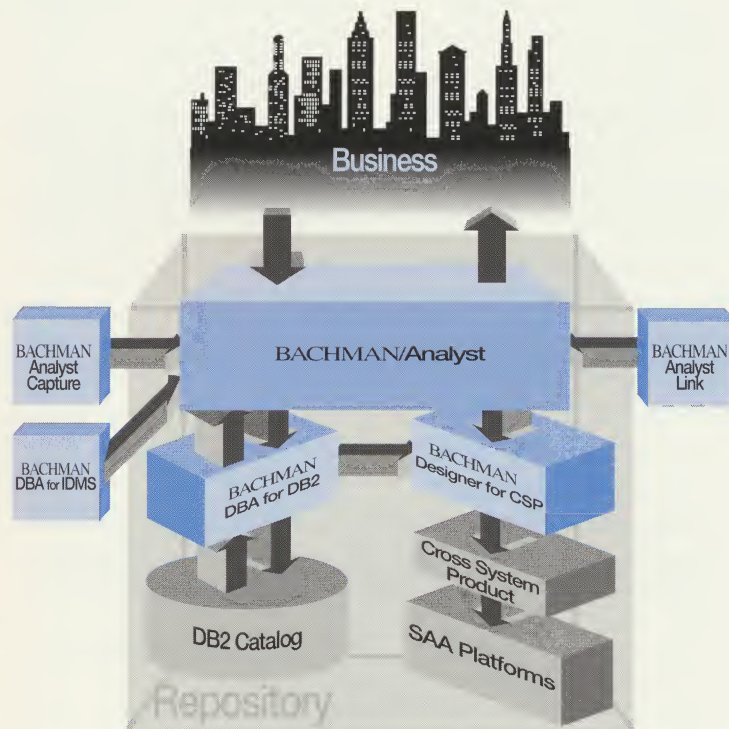


The BACHMAN solution for relational applications

Enter BACHMAN, the model-driven development company that incorporates re-engineering technology. Based on a re-conception of the software development life cycle, BACHMAN products address the needs of DB2 data administrators, database administrators and analysts who create new DB2 applications and enhance existing ones.

The solution is to take advantage of the investment you've made in existing database designs, and build and exploit data models and specifications, extending their useful life beyond a system's first day in production. To BACHMAN these are two facets of the same challenge — creating systems that can change to meet your business needs, and change to take advantage of developing technology.

Your business grows and changes. BACHMAN re-engineering is growth and change ... without chaos.



The BACHMAN difference

Unlike other CASE products, BACHMAN encourages you to leverage your investment in existing databases and build new data, process, and logic models that enable you to quickly generate code through IBM's Cross Systems Product (CSP).

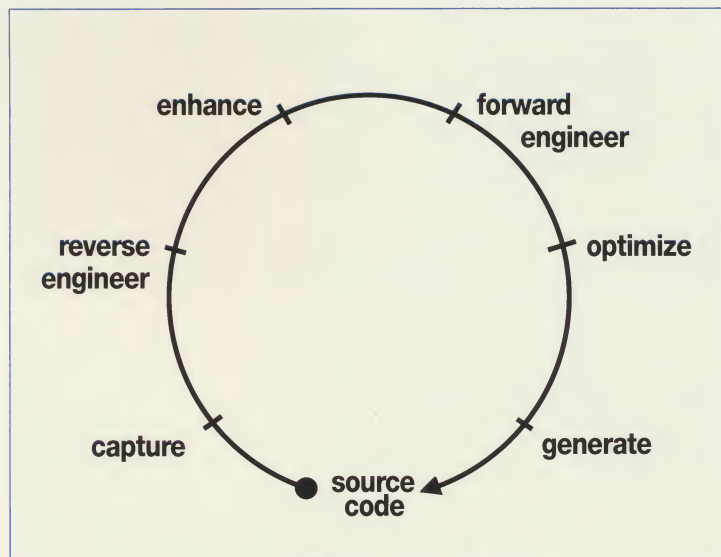
But your business requirements are not all new systems. BACHMAN can help you migrate older designs, create optimal information models at the Entity-Relationship level, and then design the best possible DB2 structures for those entities. At the touch of a mouse, you generate new or changed SQL data definition language (DDL) for your design.

It's not magic, it's re-engineering

Technically, re-engineering is reverse engineering, modification, forward engineering, and code generation.

Reverse engineering takes a physical design, obtained by extracting data structures from existing systems in DB2, IMS, IDMS, or flat files, and translates it into a data model, which is presented as entities and relationships.

Forward engineering translates a high-level model or specification into a physical design, automating the process of developing a new system or database. This in turn allows you to optimize the implementation specification, and generate syntactically correct code. BACHMAN even ensures that your generated SQL is consistent with the DB2 catalog.



Powerful solutions, but easy to use

In the BACHMAN/Data-
base Administrator for DB2, you
use icons, menus, and forms to
edit a database design. Diagrams
focus on either relational or
physical aspects. This compre-
hensive editing facility lets you
see a table on the screen, quickly
open a form full of detailed infor-
mation, and then look at related
information such as the indexes
or views on that table. You can
create, modify, or delete any type
of object.

More than pretty pictures

BACHMAN E-R and
DB2 diagrams show a graphical
summary of your model, allow-
ing you to communicate with
other groups in your organiza-
tion. But the detail behind the
model makes the difference be-
tween a pretty picture and an
asset to the enterprise.

Consider the CUSTOMER
entity in the BACHMAN/
Analyst. Behind a CUSTOMER
entity there may be reusable
process specifications for

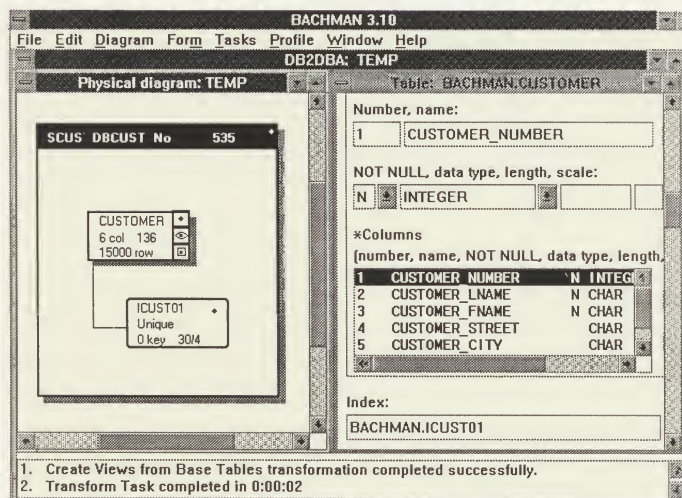
creating or deleting a customer.
There are estimates of how
many customers you expect to
have in the system over time. Of
course, there are the attributes
— the pieces of information that
make up a CUSTOMER in your
system. And the attributes
contain definitions of their data
types, lengths, and even allowed
values. There is a pointer (map)
to the physical DB2 table or
tables that represent this entity
in the production system.

In the DB2 design you
can see the pieces of information
that make up this table's defini-

tion: columns, keys, indexes,
views on this table, and storage
characteristics of the table space
(segmented? partitioned?).

And you enter informa-
tion that describes your use of
the data. Are there a small num-
ber of customers that dominate
your business?

Each piece of information
is a part of your business re-
quirements. Together, they are
your business. BACHMAN uses
this information to help you de-
fine the best system for your
business.

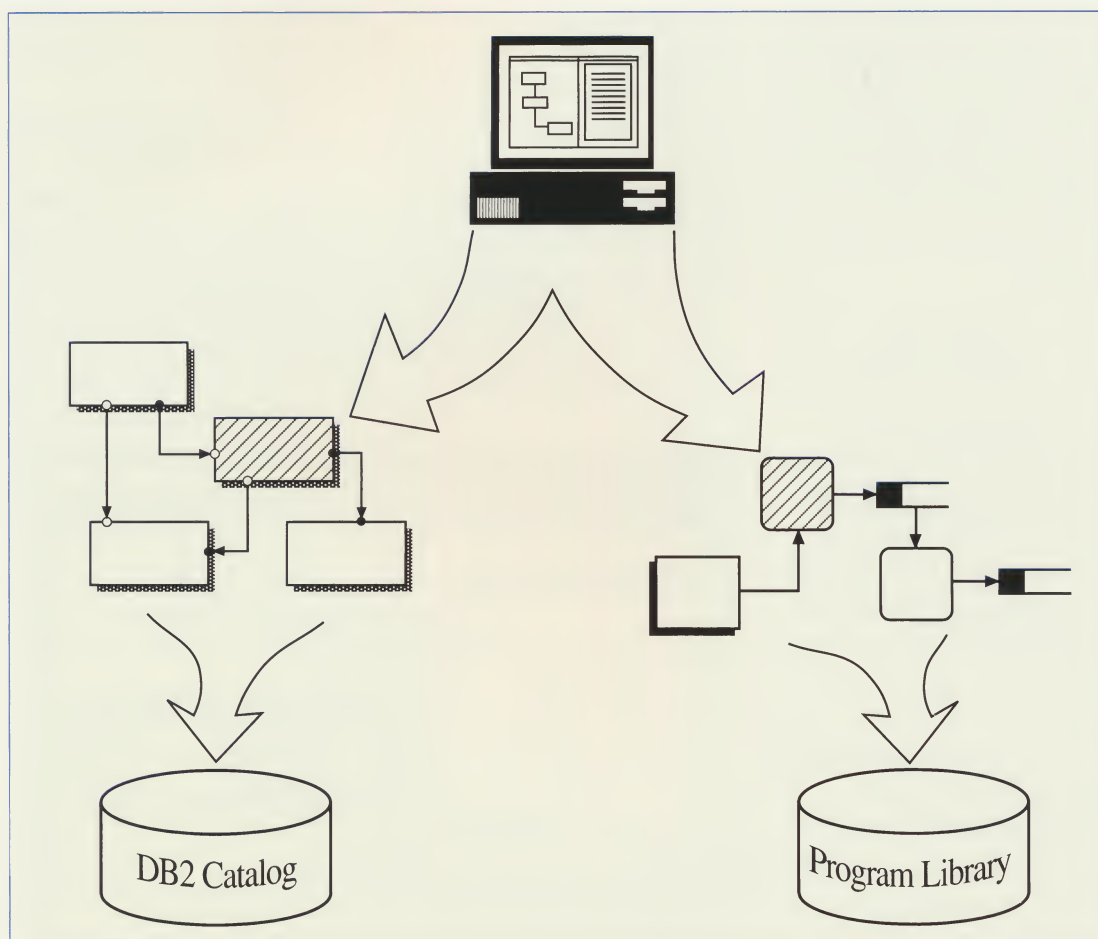


“But the business changes...”

The BACHMAN model of your business can change too, with the click of a mouse. That's the appropriate place to reflect a business change. Because the BACHMAN model is the applica-

tion and BACHMAN maintains the relationships among all the pieces, you can automatically propagate the changes into modified production DB2 databases and CSP executable code

or CSP generated COBOL. Despite the simplicity, the resulting system is optimized and production quality.



Expert assistance

The BACHMAN/Data-base Administrator for DB2 lets you build a design quickly, but it also helps you build a good design.

As you modify your design, the system provides flexibility, letting you sketch out tables now and fill in columns later...letting you change that table name, and later go back and fix the views that depend on that table. But with the system's help you can find these holes at any time and fix them before you generate DDL.

The BACHMAN/DBA for DB2 helps you produce a high-performance design, helping you allocate free space, order columns for multicolumn indexes, decide between fixed and variable definition and, where applicable, denormalize the data.

The BACHMAN/DBA for DB2 also helps you solve problems. For instance, how much free space should you allocate to accommodate data that grows by 75% each year...?

If you guessed 75%, you've wasted more than 32%

of your disk space, added 50% to your sequential I/O, and let yourself in for some sleepless nights.

With BACHMAN? Press a button to find the answer. (It is 42%.)

Now, should it be imbedded free space or at the end of the table? BACHMAN will tell you that, too!

BACHMAN incorporates the knowledge of its DB2 experts into an Expert Advisor. You can let the system make decisions, and review a system journal to check its work, or you can run interactively. How much of the system's expertise you use is up to you. BACHMAN supplies the advice — you supply your own understanding of the system requirements. The final decision is yours.

The BACHMAN/DBA for DB2 doesn't get tired or bored, either. It doesn't mind looking at thousands of objects for potential design problems. And it will only call your attention to those that are potential problems.

Build your DB2 skills

You don't just learn to use the BACHMAN/DBA for DB2, you learn from it. The system's messages, diagrams, and Help facility transfer the embedded knowledge of DB2 to newer DBAs, allowing them to learn as they work. Experienced DBAs are free to tackle the knotty problems, doing what they do best.

And the BACHMAN/DBA for DB2 is still learning. It gets smarter in each release.

The BACHMAN/Analyst

The BACHMAN/Analyst lets you use the same quality graphics and windows to build an enterprise model that consists of a data model: entities and relationships, process models: detailed specifications of processing against the data, and logic models: procedural business specifications that reference the data model.

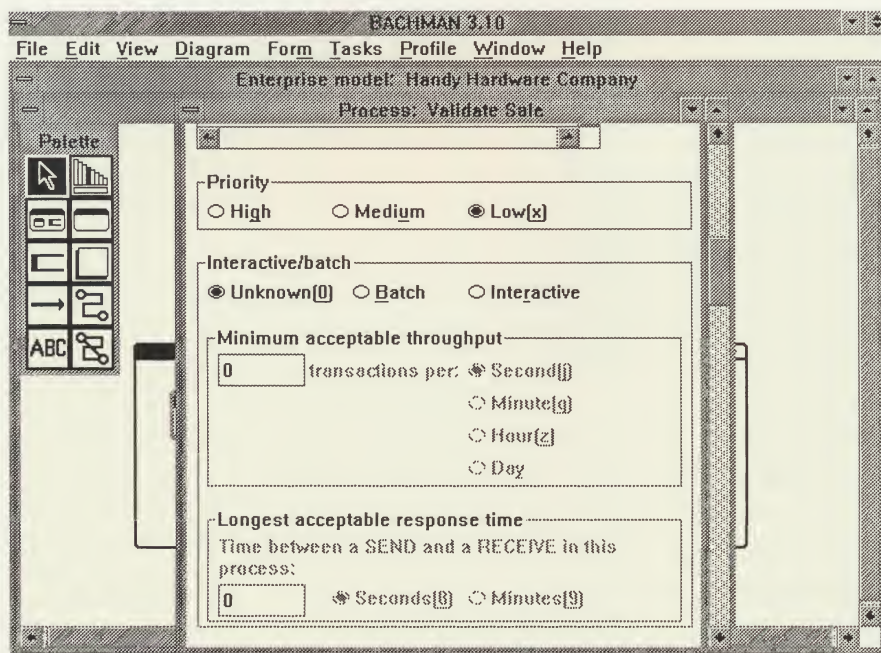
We've said that through forward engineering the

BACHMAN/Analyst provides the entities and relationships that make up the tables and columns in your DB2 design. The Analyst advantage goes further than that, it tracks what your processes are doing with the data.

For each process, the BACHMAN/Analyst records performance requirements that can be used to create a high-performance database design.

You can highlight the processing that occurs against each piece of data, and optimize your design before it reaches production.

Process and logic specifications are implementation-independent. When technology changes, and it will, the designs you create today live on in the new systems. Forward engineering takes care of the implementation details.



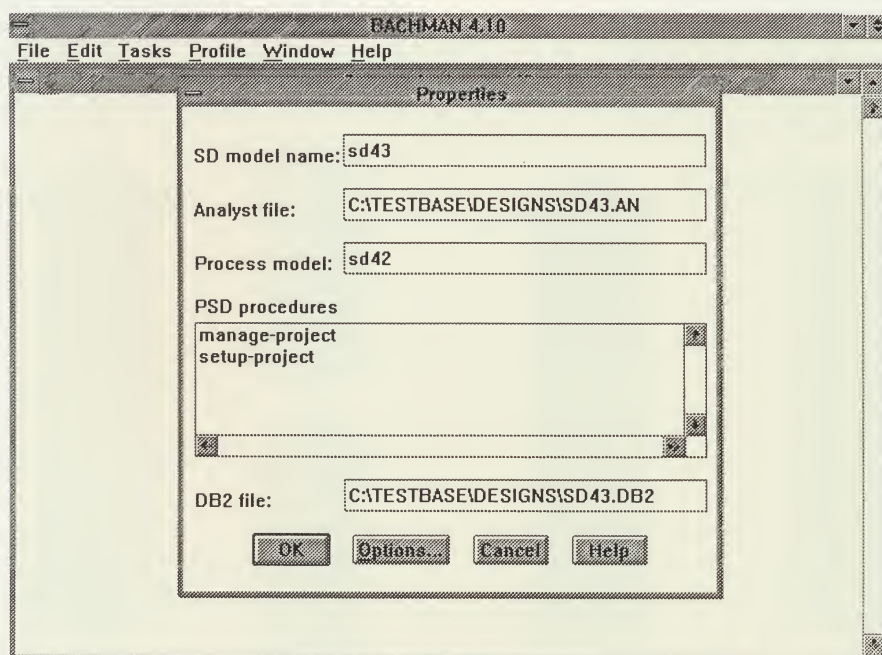
The BACHMAN/Designer for CSP

The BACHMAN/Analyst and the BACHMAN/Database Administrator for DB2 are joined by the BACHMAN/Designer for CSP. This product transforms business logic specifications to CSP in IBM's SAA External Source Format (ESF). Entity level data requests are translated

into SQL statements that use the tables in your BACHMAN DB2 design. All this can be imported into CSP/AD, and used to generate CSP/AE execution modules or COBOL code. This integrated BACHMAN/IBM solution takes you quickly from conceptual models to optimized production

DB2 CSP or COBOL code.

Data structures change? New CSP capabilities? No problem. Run the same model back through the BACHMAN/Designer for CSP for updated SQL and program logic.



Flexibility to fit any methodology

Your organization already has methods for creating new systems and modifying old ones. BACHMAN supports that methodology, providing tools to make your work easier. It is flexible enough to help you build a good design following any path you choose.

The story doesn't end

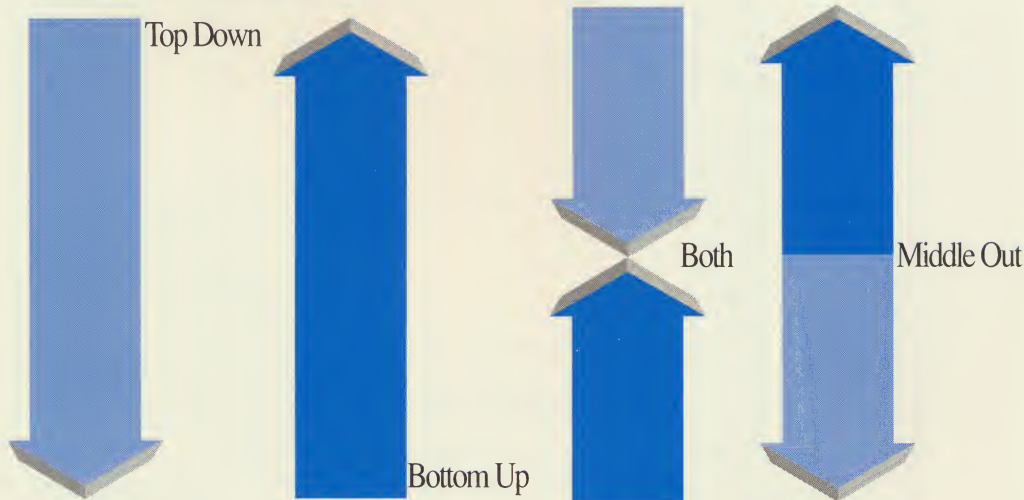
Other CASE products might help get your application into production, but BACHMAN protects your investment by re-

taining the entities, relationships, tables, specifications, and mappings between them. You can respond to changes in business requirements, make the change at the appropriate level, and then propagate the change into the production system. You've built a living model of your business that you can use to build new systems at a fraction of the cost, and communicate with every work group.

A strategic investment

When you choose to take advantage of other AD/Cycle components such as IBM's Repository, BACHMAN products can help. As an AD/Cycle Business Partner, BACHMAN is helping IBM design the models at the heart of the Repository. BACHMAN will implement AD/Cycle solutions that allow you to use Repository along with the BACHMAN/Analyst and BACHMAN/DBA for DB2.

BACHMAN supports your methodology.





BACHMAN and DB2 — An Unbeatable Combination

The BACHMAN/Data-
base Administrator for DB2,
combined with the BACHMAN/
Analyst, BACHMAN/Designer
for CSP, and related products,
can help you use DB2 as it was
meant to be used, while
exploiting enterprise modeling,
promoting a model-driven ap-
proach to application develop-
ment, and fulfilling the promise
of AD/Cycle.

So...why is IBM telling you
about BACHMAN in this book?

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to apply these benefits to your
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☐ DB2 ☐ SQL/DS ☐ IMS ☐ CA-IDMS

☐ Other _____

IBM Mainframe models:

My IBM MR/SE is:

Name _____

Title _____

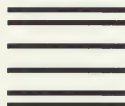
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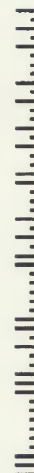
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BACHMAN

For more than software. For business.





In recognition of its value to our customers, IBM has designated BACHMAN a Cooperative Software Supplier Program Business Partner.

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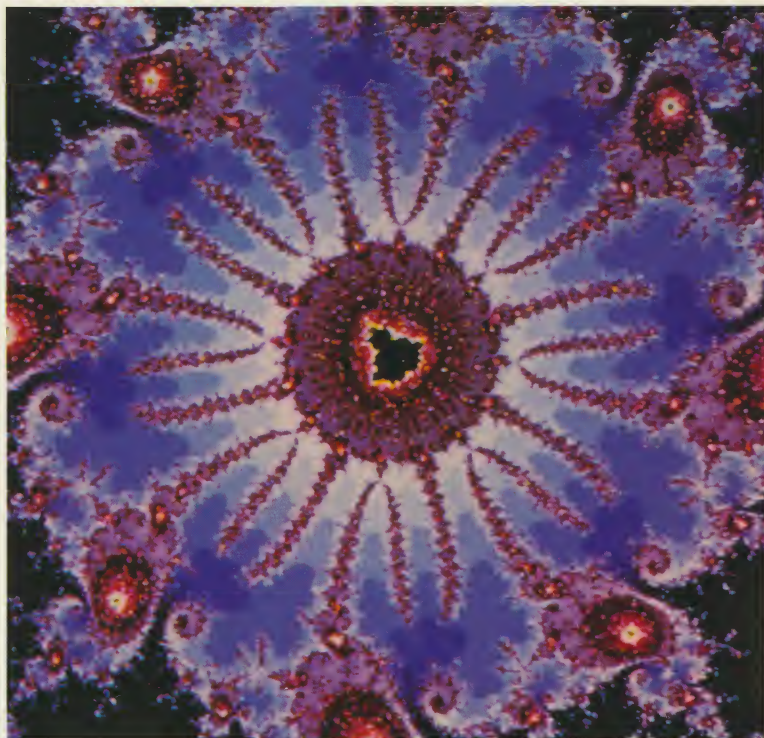
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BACHMAN

For more than software. For business.



About our cover:

BACHMAN products bring order to information systems. Fractals (like the one on our cover) are used to achieve the same end in many disciplines.

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For more than software. For business.



BACHMAN/Analyst

A MANAGER'S VIEW OF FUNCTIONALITY AND BENEFITS

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Why is there a BACHMAN/Analyst?

Building Better Systems

The BACHMAN/Analyst™ helps data analysts, systems analysts, and business analysts build better information systems. It does so while allowing these professionals to work more quickly and more cost-effectively than ever before. As an integral part of the BACHMAN/Re-Engineering Product Set,® it shares a capability for helping to translate the business requirements of an enterprise into real-world production-quality systems.

The comprehensive capability of the BACHMAN/Analyst to define data, processes, and business rules permits users to manage the effects of changes in business requirements at the specification level. Freedom from implementation details—for example, avoiding the use of embedded code within models—has powerful implications about the ability to respond rapidly to end-user needs with high quality solutions.

The BACHMAN/Analyst helps create models of systems which can be optimized for performance via tightly integrated BACHMAN and IBM companion products. It combines in-depth, embedded expertise with state of the art graphic editing tools for converting requirements into “code-ready” specifications. In short, the BACHMAN/Analyst represents the ultimate approach to building and maintaining information systems.

A Complete Specification Environment

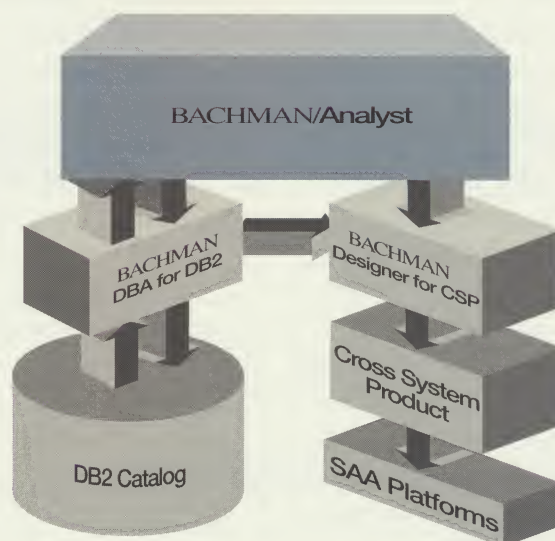
The BACHMAN/Analyst is a comprehensive, easy to use, integrated environment for defining specifications in a structured manner that is fully compliant with the IBM Systems Application Architecture (SAA) and Common User Access (CUA) standards. Analysts are provided significant assistance in producing complete, semantically correct specifications that satisfy business requirements, and are readily executable.

The BACHMAN/Analyst generates “live” models that are dynamic and easily kept in synchronization with database designs. This is a unique capability. It reinforces the productivity and performance benefits of conducting maintenance at the specification level, independent of the details of implementation.

Enterprise models—data, process, and logic—developed on the BACHMAN/Analyst can be shared through the use of filters and intelligent merge facilities, enabling the work of many analysts to be combined. Additionally, in the near future these models will be able to be stored and shared by means of Repository Manager/MVS.

The BACHMAN/Analyst gives users the easy ability to reuse logic specifications stored with the entities they act upon. This will speed the translation of end user requirements into production applications.

Through clear graphic diagrams and explanations of business rules in plain English, the BACHMAN/Analyst facilitates an understanding of the entire system and of individual system components by a wide spectrum of end users, including business analysts and non-MIS staff.



How does the Analyst fit your organization?

The Product with a Custom Fit

Albert Einstein said, "Make things as simple as possible, but no simpler." From the Chinese, we have the long accepted adage that "one picture is worth a thousand words." These truths are equally evident today in business and in the ways that CASE can deliver the benefits of modeling to an enterprise. BACHMAN believes that modeling—which has the potential to make things graphically "as simple as possible, but no simpler"—must address the *business* needs of the enterprise.

To make it easier for analysts and their colleagues to respond rapidly and more effectively to changes and opportunities in the business and technological environment, we make products that allow users to work in the most productive way possible — that is, they work the way they find best to do their jobs.

The BACHMAN/Analyst fulfills this promise, offering powerful graphic tools that help to capture, represent, and edit data, process, and logic models in highly flexible and versatile ways. This permits users of the BACHMAN/Analyst to work as they see fit.

The BACHMAN/Analyst helps build a single, complete, and unified model of data, processes, and logic. This unified model can be viewed from four different perspectives using four editors. Users can switch among editors at a mouse click, accessing the most appropriate way of viewing that

aspect of the model requiring work. Changes made in any one editor are reflected immediately in the others, because of the underlying unified model. As a result, analysts can attack a problem or begin a project from the most appropriate perspective, instead of being bound to a single approach.

The E-R Model—with Reusability

The information model can be viewed and edited through an extended version of the BACHMAN/Data Analyst product's data model editor. This data model facility maintains the existing interface with the BACHMAN/DA Capture™ and BACHMAN/DBA™ products.

A significant new feature offers the ability to store reusable modules of specification logic, i.e. procedures or methods, with the entity on which they operate. These modules—the building blocks of future application specifications—are called entity methods. Working with this library of reusable procedures speeds the application development process and leverages knowledge throughout the organization, thereby reducing cost of future development.

The Data Flow Diagram—with Explosions

The data flow diagram (DFD) editor enables modeling of the flow of information. The data flow can be modeled:

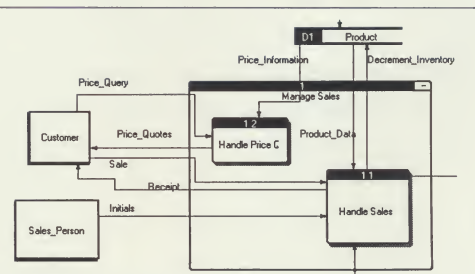
- Into and out of an application area
- From and to external agents
- Into, out of, and between processes
- To and from data stores

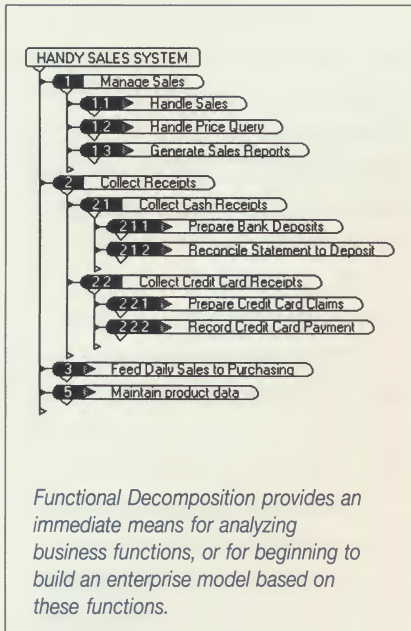
Processes in the DFD can have subprocesses and data stores set up inside them, with the detail hidden or shown as required. For further analysis, users may choose to explode processes into more detailed diagrams, with no limit to the number of levels of explosion created. This enables both improved understanding and communications among users of the BACHMAN/Analyst and their end user colleagues.

The Functional Decomposition Diagram

The functional decomposition diagram (FD) displays sub-functions of functions, beyond the function boundaries, created without depicting external agents, data flows or data stores.

The Data Flow Diagram allows analysis of processes by exploding them to more detailed levels.





Many users find it easier to start building a model through this perspective, in the temporary absence of a data model, if there is a great deal of information about business functions. Working with the FD enables an uncluttered view of the system, which has particular value at the early stages of development.

The Process Specification Diagram

Logic is specified for primitive processes identified in the DFD or FD in a Process Specification Diagram (PSD). The PSD rounds out the suite of editors in the BACHMAN/Analyst.

In certain ways the PSD is the crowning touch of the many innovations incorporated into the BACHMAN/Analyst. With the PSD, a busi-

ness can do what it has never been able to do before—create a model of the rules that define the operation of the business. The PSD has a unique capability for depicting any business logic, including that for derived attributes, as diagrams and text. It is robust enough to depict all the business rules of the enterprise, yet flexible enough not to overwhelm the user. When working on designs of enormous scope, users can regulate the degree of complexity revealed in the PSD through the use of filters.

The analyst writes logic specifications in terms of entities, attributes, their relationships, and their access patterns. Access patterns can be taken into account by a DBA using the BACHMAN/DBA for DB2 product to produce optimal database designs.

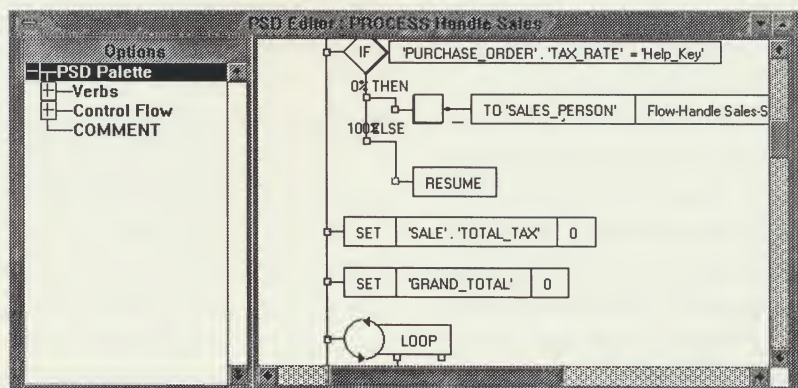
The logic of PSD is complete and rich, in that it can express any business rule, practice or requirement. Anything that can be expressed in a 3GL or 4GL can be defined in PSD.

Work as You Choose

Users work with the BACHMAN/Analyst as they choose. This means that you may start a model, or a work session on existing models, with any one of the four editors, switching among them as tasks require.

Users can discover and evolve the approach that fits most readily with their work style and the overall development strategy of the organization. In actual use, the BACHMAN/Analyst and companion products will prove compatible with the vast majority of popular methodologies. Generally, users can get up and running with minimal training.

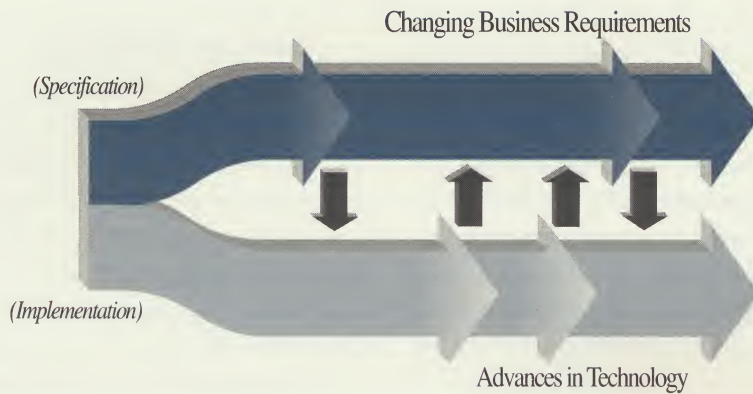
The superiority of the specification level approach to building and maintaining systems is exploited with the BACHMAN/Analyst. It's an approach that allows definition of the system without the encumbrance of specific details of implementation.



Creating a Process Specification Diagram is straightforward and largely intuitive.

How does the Analyst promote better quality systems?

Specifications Come First



BACHMAN lets you address business and technical changes independently—accelerating progress.

Professionals with the word “analyst” in their title have to see through two sets of eyes to make sure systems will meet end-user requirements. They have to see the business through end-user eyes, and the information system through MIS eyes. The BACHMAN/Analyst facilitates this dual task. It provides for the representation of business rules and business logic in easily understood forms that are readily translatable into high-performance physical systems.

Business requirements dictated by end users and business analysts and modeled by the data and systems analysts are most easily understood with diagrams that, when necessary, can be expressed in plain English. The BACHMAN/Analyst offers the pictures and the words. It affords four different ways of looking at models with diagrams of such clarity and directness that they are meaningful to technical and nontechnical users alike.

Detailed specifications of complex systems burdened with the technicalities of the physical

implementation are harder to deal with. The BACHMAN/Analyst averts the problem entirely. It allows users to deal with specifications stripped of implementation details.

Specifications need to be understood by end users and translatable by database administrators and programmers. The BACHMAN/Analyst, in addition to helping satisfy end-users that their requirements will be met, provides MIS professionals working at the implementation level with code-ready specifications that are syntactically correct, that encompass details that will enhance optimization tasks, and that allow them to concentrate on the creative aspects of their jobs.

It has been proven time and time again that it costs less to correct the inevitable errors of the development cycle early in the cycle. The BACHMAN/Analyst allows maintenance of systems that can be readily kept in their simplest form, always up-to-date, and perpetually active in the “low-cost” portion of the cycle.

The BACHMAN/Analyst incor-

porates unique features and functions which help ensure the generation of production quality systems by database administrators and programmers. Powerful capabilities, like reuse of procedural methods, ensure that “tested” code, proven free of errors, will often be available for rapid implementation of new applications. Expert advisors further protect against the use of incomplete or inaccurate specifications (which protects against generating bad code during forward engineering).

The BACHMAN/Analyst also promotes higher quality systems through its integration with the BACHMAN/Database Administrator for DB2 product.

Access Based Design

Process and logic models created in the BACHMAN/Analyst incorporate details related to data access. These statistics, such as the priority of the process, whether it is online or batch, the expected frequency it will be run, and even peak periods of use, are made available to the database administrator. This information enables Access Based Design.

Access Based Design in turn allows for tuning a database in order to optimize application performance. This powerful design capability is possible only with the BACHMAN/Analyst because of its unique ability to capture, retain, and transform performance requirements to be used by the database administrator.

How does the Analyst promote better quality systems?

Another Blow to Re-Inventing the Wheel

One of the chief obstacles to breaking the applications development backlog is redundancy—the unavoidable rewriting of procedures which are used for similar reasons in otherwise unrelated programs. Unfortunately at present, most information organizations are so huge and complex there is no feasible means of cataloging, never mind documenting, applications in terms of their purpose or functionality. Code which solves a common problem can remain embedded in its particular application, inaccessible to others.

BACHMAN Entity-Relationship data models capture specifications of business-related entities. Logic models capture specifications. BACHMAN integrates these models so logic specifications can be encapsulated along with the entity on which the logic operates. These pieces of reusable logic specification, called “entity methods,” are free of implementation details and do not change unless business rules change.

Entity methods—and, similarly, attribute derivation rules—are avail-

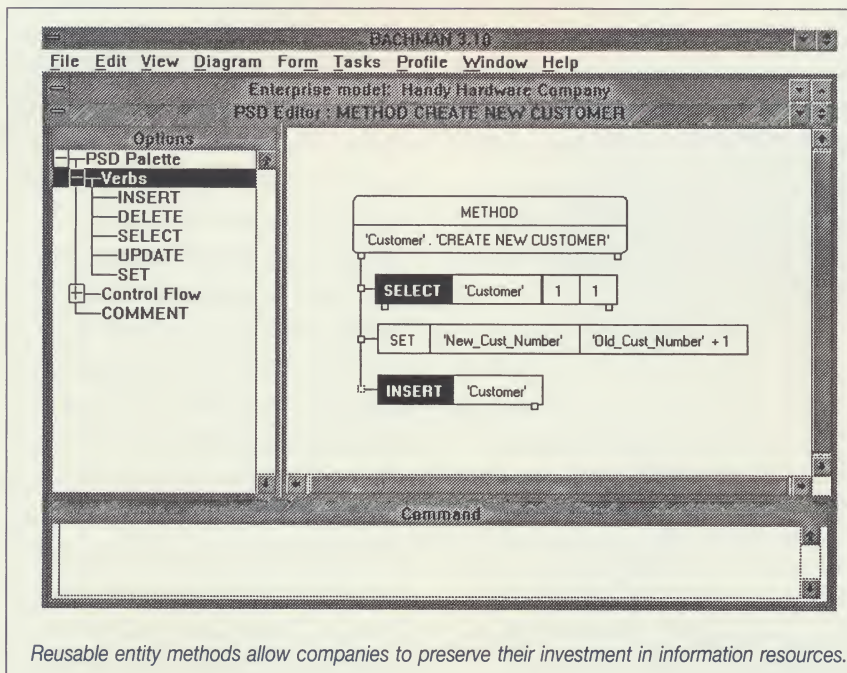
building blocks.

The BACHMAN model of your business also contains application procedures that define the sequence in which methods will be used. These specifications can then be readily forward engineered into DB2 application environments with companion products from the BACHMAN product line. Once specifications are forward engineered in this way, the resulting designs and applications can be optimized and quickly compiled for use.

Beyond Productivity

In addition to the obvious ways in which reusability will contribute to productivity gains, there are additional benefits to these encapsulation techniques. By preserving the “building blocks” of future application needs in reusable form, the BACHMAN model ensures uniform quality of the applications that derive from this method and, as time progresses, will comprise a knowledge base of procedures which represent the way in which the business is run.

Quality is further enhanced because the BACHMAN/Analyst is tightly integrated with implementation level BACHMAN products. In combination with the BACHMAN/Database Administrator™ for DB2, and the BACHMAN/Designer™ for CSP, the BACHMAN/Analyst and its advanced features ensure that production quality performance of designs and programs will be consistent and dependable.

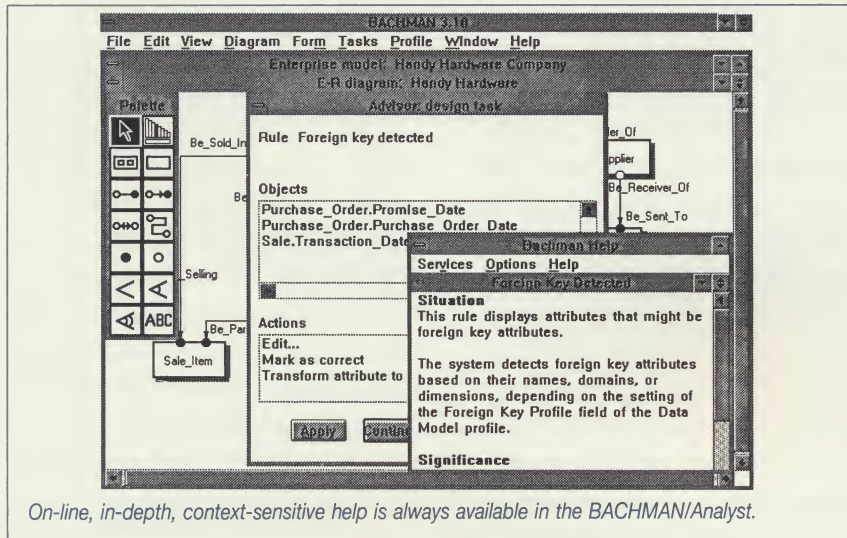


Borrowing from the concepts of object-oriented technology, the BACHMAN/Analyst has features and capabilities that will go a long way to alleviate this problem through reuse.

able throughout the BACHMAN/Analyst. Once a collection of entity methods and derived attributes has been built, new applications can be specified by any user very quickly from these

Where does the "smart" in BACHMAN smart models come from?

An Expert View of Business Needs



An embedded knowledge base of immense breadth complements the range of capabilities built into the BACHMAN/Analyst. It provides help across the entire organization both to novices and experienced analysts. It helps analysts in the earlier stages of their careers through interactive tasks. It instructs as work progresses. Experienced analysts are assisted because the Advisor can be set to provide instant feedback on accuracy or completeness of actions taken.

Instruction and Expert Assistance

The BACHMAN/Analyst incorporates many rule-based tasks which provide assistance in several areas:

- checking for consistency
- validation for completeness
- interactive normalization
- merging multiple models into one
- a broad range of "transform" tasks for complex edits.

Because the novice will want close attention, the built-in Advisor can be set to take actions, while providing rationales and explanations of underlying rules. This makes the expert assistance provided by the BACHMAN/Analyst unequalled for literal on-the-job training.

Users can choose to take an action recommended by the Expert Advisor, override with an alternative of his or her own, or return to the task later. Users with more experience will want to use the BACHMAN/Analyst at its lower levels of interaction, reducing the amount of intervening instruction.

BACHMAN expert assistance incorporates an ability for automatically handling many of the routine tasks of the data and systems analyst. This means that a highly experienced professional can concentrate on the more creatively demanding aspects of the job while the BACHMAN/Analyst

unobtrusively takes care of exacting computational tasks.

Context-sensitive help is always available, at any level of assistance. Expert assistance is always on tap, whether as a continuous learning aid, or a mere memory aid for the more experienced analyst. Many "pros" report that BACHMAN often makes suggestions that would not ordinarily have occurred to them.

Well-founded Expertise

Years of experience in data and process modeling and the translation of business rules into logic that speaks both to end-users and MIS have been incorporated into the BACHMAN/Analyst. The specific combination of data, process, and logic specifications is unique and depends on the unequalled depth and variety of expertise BACHMAN has embedded in this powerful, yet easily mastered, tool.

The senior level insights and innovations are a boon to the novice analyst and a significant adjunct to the skills of the experienced user. They represent the collective experience and knowledge of the entire BACHMAN staff, notable among them, Charlie Bachman, Chris Gane and Chris Loosley, as well as our vast user community, which contributes insights through our development partners.

How does the Analyst work with other products?

The Power of Integration

The BACHMAN/Analyst is a fitting addition to the recognized capabilities of the BACHMAN/Re-Engineering Product Set as a whole.

BACHMAN products comprise an unequalled platform for developing information systems which are uniquely responsive to changes in the competitive business environment and advances in the technical environment.

BACHMAN/DBA and Capture products allow for reverse engineering of existing system designs to the BACHMAN/Analyst for enhancement and eventual migration to other technologies, such as DB2. The BACHMAN/DBA for CA-IDMS® captures schemas which can be directly converted in this way. The BACHMAN/Capture™ products for IMS, and COBOL data structures provide an equivalent facility for designs stored in these formats.

When work has been completed in the BACHMAN/Analyst, fully normalized data specifications—with performance requirements incorporated—are forward engineered to the BACHMAN/DBA for DB2. Here designs are optimized according to the specific configuration of the DB2 environment.

Process specifications developed in the BACHMAN/Analyst are forwarded to the BACHMAN/Designer for CSP, where they are combined with database design information from the BACHMAN/DBA for DB2 to improve the quality and perfor-

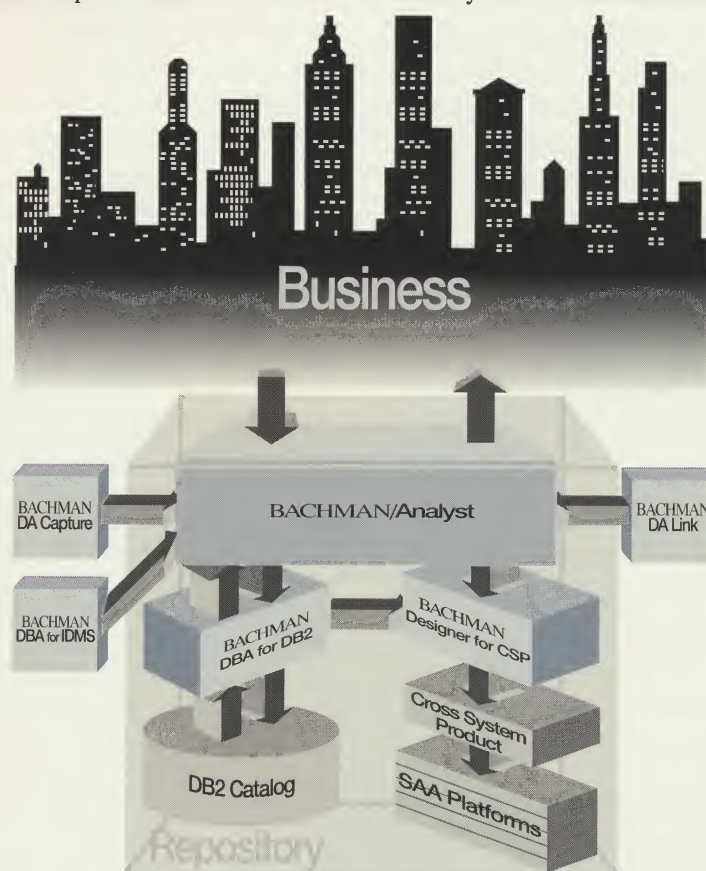
mance of CSP DB2 applications. The beauty of this approach is that such applications can be generated and maintained from BACHMAN/Analyst models, which preserve current data, process, and logic specifications independent of implementation details. This arrangement makes for highly productive application development.

Links to Third Parties

The BACHMAN/Analyst integrates with BACHMAN/DA Link™ products to capture data models from

external sources. Links exist with ADW, IEW, and Excelerator so that users of these other products can take advantage of the power of the BACHMAN/Analyst to prepare for production in the DB2 environment.

Moreover, the BACHMAN/Analyst offers facilities to expand its general ability to link with tools outside the BACHMAN development environment. Import and export utilities built into the BACHMAN/Analyst support productive exchanges of information with many other CASE and DB2 tools.



The BACHMAN solution integrates products essential to the advancement of business.

What strength lies behind the BACHMAN/Analyst?

BACHMAN Support: The Human Factor

Bachman Information Systems maintains a comprehensive training and customer service organization in support of all BACHMAN products. The aim is self-sufficiency for customer organizations, while making sure every possible means of support is available as progress is made towards that goal.

BACHMAN offers several types of product training, taught by our technical staff, which cover the use of individual BACHMAN products.

BACHMAN provides a four-day course introducing the BACHMAN/Analyst to systems analysts, data analysts, designers and programmers. It covers the development, maintenance, and enhancement of applications systems. During the course, students are introduced to the basics of data, process, and logic modeling, why each is important, and how the BACHMAN/Analyst supports the integration of these models. For organizations new to modeling, BACHMAN offers a workshop in data, process, and logic modeling within the scope of BACHMAN products.

Courses are available at BACHMAN training facilities or may be arranged at customer sites.

On-going support and services are covered by a maintenance contract. Services provided under the contract include:

- Access to an electronic bulletin board to which customers can send questions, comments, and suggestions 24 hours a day, seven days a week. Prompt replies from BACHMAN support representatives are assured.

Regular user meetings are scheduled throughout the year and the Annual Bachman User Conference is held in the spring. Details are available through our sales offices.

Help Getting Started

BACHMAN also provides support to MIS organizations engaged in new system development or planning and implementation of pilot projects. BACHMAN product specialists will confer with end users and IS staff responsible for building the system to help define the basic data and processing requirements. In this way, we can serve a pivotal role in facilitating the design of the system.

Projects typically last from four to sixteen weeks, with BACHMAN staff available regularly on-site as needed. The length of involvement and the degree of participation of BACHMAN specialists is a function of several factors, including user requirements, skill levels, and the nature of the project. Confer with your local BACHMAN sales office for details.

A World-Wide Sales Network

BACHMAN maintains sales offices in selected major North American cities, with authorized distributors in throughout Western Europe and in 18 countries of the Asia/Pacific Group, all offering customer support, training, and consulting. Product demonstrations generally can be arranged through the IBM Customer Service Center in your area. Contact your local BACHMAN representative, or IBM.



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BACHMAN

For more than software. For business.

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BACHMAN/PLUS



BACHMAN helps companies meet the challenge of mounting competitive pressures and exploit the opportunities of advances in information technology.

BACHMAN/PLUS helps MIS professionals using the BACHMAN/Re-Engineering Product Set develop self-sufficiency in creating and maintaining complete, semantically correct data, process, and logic specifications, as well as optimized database designs and applications. The resulting systems are of production quality, are easy to build and maintain, comply fully with IBM standards, and provide superior performance to end users.

BACHMAN

For more than software. For business.

BACHMAN offers a multi-faceted program of services designed to promote self-sufficiency among BACHMAN customers. *Providing Links to User Success*, or PLUS, produces rapid transfer of implementation skills along with planning, modeling, and design expertise. BACHMAN/PLUSSM is the means for BACHMAN and user teams to: 1) evaluate user skill levels and facilitate successful implementation of the BACHMAN/Re-Engineering Product Set,[®] with specific emphasis on the BACHMAN/Analyst, 2) provide the skills necessary to ensure success, and 3) develop detailed plans for successful applications. BACHMAN/PLUS is available in five parts, with all parts tailored to the needs of the specific customer organization.

Highlights

- Ensures smooth incorporation of the use of BACHMAN products into customer's current approved methodologies, and assesses need for new working practices, if any.
- Plans training for all levels in the organization.
- Minimizes training period required for successful transfer of skills.
- Identifies candidate projects, determines project selection criteria, and defines success factors.
- Provides management understanding of the incorporation of the BACHMAN/Analyst into current work practices.
- Provides documentation of working practices for using the BACHMAN/Analyst in the customer organization.
- Provides standards for documenting designs and naming objects.
- Develops techniques for building application design models.
- Justifies project selection and establishes guidelines for measuring project success.
- Familiarizes practitioners and nonpractitioners, including technical management, with product concepts and facilities, as required.
- Trains appropriate customer IS staff in working practices, procedures, techniques, and guidelines.

Management Overview

Success in business results from a few key factors. One is the contribution of MIS to competitive advantage.

CASE can play a major role ensuring that an IS organization makes an effective contribution toward this objective. Many organizations that are successful in their implementation of CASE share characteristics that suggest a foundation for success.

Keys to Success

Certain success factors can be defined as objectives in the ongoing process of CASE product selection, training, and organizational development. For example, quality and productivity are the chief goals of successful CASE implementations. Successful organizations tend to have formal life cycle management methods in place.

You will find that most organizations successful with CASE are likely to have had extensive training, that they are using both "front-end" and "back-end" CASE tools, and that they plan to extend CASE usage. Finally, and not surprisingly, they have the backing of top management.

The Role of BACHMAN/PLUS

BACHMAN/PLUS is designed to help MIS implement BACHMAN products and make CASE a success. It ensures the rapid transfer of application modeling and design skills, enabling the delivery and maintenance of high performance information systems.

BACHMAN/PLUS also provides help in the selection of projects appropriate to the successful implementation of BACHMAN products.

Most importantly, BACHMAN/PLUS provides a context for assured success, success which is measurable and of meaning to management. The ultimate aim of BACHMAN/PLUS is the development of self-sufficient user organizations. As such, it establishes and upholds the highest standards of implementation, as well as a comprehensive plan for skills assessment, project development, training, and on-going support.

BACHMAN/PLUS is offered in the form of self-contained, programs of pre-determined length. Each program has a defined set of objectives. Overall, BACHMAN/PLUS starts with a brief on-site assessment phase, which determines the best strategy for implementing BACHMAN products within the existing user organization.

Competitive Advantage



Skills Assessment and BACHMAN Implementation Plan

We develop a detailed BACHMAN product implementation plan with you, based on our assessment of skill levels within your organization. We also make specific training recommendations. BACHMAN staff participates in the identification of candidate projects as well as in the development of a process for project selection and measuring success. Finally, we review your systems development methodology in order to assess the need for new working practices to fit in with your methodology.

Deliverables include:

- Training plan for all levels in the organization
- Identification of candidate projects
- Determination of project selection criteria
- Definition of project success factors
- Evaluation of current methodologies
- Assessment of the need for new or additional working practices
- Detailed BACHMAN/Analyst implementation plan

Application Design Practices and Techniques Review

During this phase BACHMAN staff assimilates systems and development strategies in place at the customer site. We review major steps and phases that make up the methodology, as well as the current notation and diagramming conventions. We then develop working practices, techniques, and guidelines for successful use of the BACHMAN/Analyst within the current development environment.

Deliverables:

- Management understanding of the extension of current methods to include BACHMAN/Analyst
- Documented work practices for using the BACHMAN/Analyst
- Well-developed standards for documenting designs and naming objects
- Well-developed techniques for building application design models

Project Selection

BACHMAN and client managers will jointly recommend a project based on the candidate projects identified during the assessment period (see above), by using the project selection criteria and success factors also developed at that time. Issues such as management commitment, business complexity and user need are important in the selection of an appropriate project. The scope of the project will be clearly defined so that we can accurately gauge the success of the effort at its conclusion.

Deliverables:

- Justification for the project selected
- Specific measures of success for the project

Education and Skills Transfer

Based on our findings, we will provide training classes and workshops focused on setting realistic management expectations and transfer of necessary skills. Classes will include tool-specific information for the practitioners, as well as tool concepts and facilities for the non-practitioners. We will also provide training and discussion of working practices, techniques, and guidelines as outlined above.

Deliverables:

- A half-day management overview presentation, including details of the implementation plan, scope of the project, and tool concepts
- A one-day concepts and facilities review for technical managers and supervisors (This will provide a forum for high-level discussion of the BACHMAN/Analyst, for reviewing the details of the implementation plan, and for discussion of the working practices.)
- Comprehensive training in technical product use and working practices
- A one-day postproject review

Project Facilitation

During this phase, we will work with the application and user design team to develop a detailed business design for the application. The primary vehicle for accomplishing the goals of this phase will be a "Joint Application

Design" (JAD) session, with various attendees from the customer site. Typically, BACHMAN staff will be the JAD facilitators, while customer staff records design information in the BACHMAN/Analyst.

At the conclusion of the JAD session, the team will work together to develop a design document that best meets the customer needs for management, technical, and business review of the design.

Also, we will meet with appropriate end-user and IS management at the conclusion of the JAD session to review the specifications developed by the project team for completeness, consistency, and for meeting objectives defined by business requirements.

Getting Started

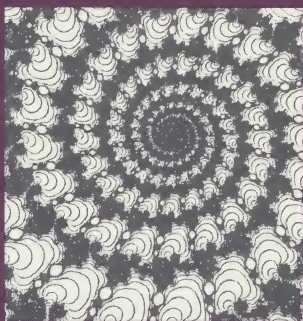
The implementation of BACHMAN/PLUS within your organization will depend on the scope of your organizational needs and the size of the project selected.

Scheduling BACHMAN/PLUS can be arranged either by calling **1-800-BACHMAN**, or through your local BACHMAN representative.

BACHMAN

Bachman Information Systems, Inc.
8 New England Executive Park
Burlington, MA 01803-5007
Telephone: 617.273.9003 / 800.222.4626
Fax: 617.229.9904

BACHMAN/ Database Administrator for DB2



BACHMAN helps companies meet the challenge of mounting competitive pressures and exploit the opportunities of advances in information technology. With the BACHMAN/Database Administrator for DB2 and the BACHMAN/Re-Engineering Product Set as a whole, MIS professionals can create and maintain complete, semantically correct data, process, and logic specifications, as well as optimized database designs and applications. The resulting systems are of production-quality, are easy to build and maintain, comply fully with IBM standards, and provide superior performance to end users.

BACHMAN

For more than software. For business.

The BACHMAN/Database Administrator™ for DB2 brings the recognized performance of this powerful database design product to the OS/2™ EE platform. The DOS product's capture and design capabilities are significantly enhanced. As a result, the BACHMAN/DBA™ for DB2 helps DBAs and data analysts create production-quality DB2 systems that meet AD/Cycle™ requirements. With OS/2, the enhanced capabilities of the BACHMAN/DBA for DB2 allow for engineering larger designs faster.

The BACHMAN/DBA for DB2 is intended for DBAs at all levels of experience. DBAs use BACHMAN/DBA for DB2 to develop new high-performance database designs, to optimize existing DB2 designs, and to pull designs from other platforms — COBOL, IMS™, PL1, and CA-IDMS® — into DB2 designs. This allows the DBA to make immediate and effective use of information that resides throughout the information network.

Using the BACHMAN/DBA for DB2 allows the DBA to produce an optimum DB2 design, and do it in less time than other methods. The power of the BACHMAN/DBA for DB2 is enhanced because it is fully integrated with the entire BACHMAN product set, including the BACHMAN/Analyst™ — helping the IS organization as a whole move from analysis to implementation.

Highlights

- Automates routine DBA tasks.
- Handles large designs.
- Supports mass creation of DB2 objects by database analysts through a quick data-entry form.
- Works with BACHMAN/Analyst Capture products to capture database designs from CA-IDMS, IMS, PL1, and COBOL, for migration to DB2.
- Provides view support, making it possible to capture, update, generate, define, and maintain views within the BACHMAN/DBA for DB2.
- Supports user-built reports using Query Manager, and provides 15 standard reports.
- Generates incremental DB2 DDL to maintain synchronization between a DB2 catalog and a BACHMAN/DBA for DB2 design.
- Offers enhanced calculation of space and free space for handling file hot spots or skewed growth during DASD allocations, in order to reduce or eliminate costly processing associated with row relocation.
- Complies with SAA and CUA; shortens learning curve.
- Exploits OS/2 EE V1.2 or 1.3 Data Manager and Presentation Manager.



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Name	Title	
Company	Address	
City	State	Zip
Telephone		

IBM Mainframe Model(s): _____ Operating System(s): MVS _____ DOS _____ VM _____

TP Monitor: _____ DBMS: IDMS _____ DB2 _____ IMS _____ VSAM _____ OTHER _____

I am using/evaluating the following software development tools: _____

Have you heard about the BACHMAN/Analyst ? _____ yes _____ no

_____ Please send me information on BACHMAN's Data, Process and Logic Modeling Products for OS/2

_____ Please send me information on BACHMAN's Data Products for DOS

_____ Seminar schedule

_____ Please have a local sales representative call me

Product Overview

The BACHMAN/Analyst brings the capabilities of the BACHMAN/Data Analyst™ to the OS/2™ EE platform. The DOS product's information modeling and data analysis capabilities are enhanced with the addition of process and logic modeling. As a result, the BACHMAN/Analyst helps systems analysts and data analysts produce complete specifications which can be forward engineered to production-quality DB2 systems that meet AD/Cycle™ requirements.

By creating an implementation-independent specification, analysts can develop a clear picture of the business system in the form of a complete unified data, process, and logic model. Both business and technical staff needs are met with a complete graphic specification.

Expert knowledge embedded in the BACHMAN/Analyst aids in developing, consolidating, editing, and validating data and process models, as well as re-engineering existing designs and applications. With the Expert Advisor as copilot, both novice and experienced analysts produce better quality systems.

The unified data, process, and logic model can be viewed and edited from any of four perspectives: data flow diagrams (DFD), functional decomposition (FD), and Process Specification Diagrams (PSD), and as data models in the form of BACHMAN Entity-Relationship (E-R) diagrams.

Models created may be based on:

- Direct input through the diagram and forms-based editors
- Merging system models
- Reverse engineering existing data definitions, including those from DB2,™ IMS,™ COBOL files, CA-IDMS,™ IEW, ADW, and Excelerator, allowing new systems to take advantage of the business rules embedded in existing systems.

These models can be forward engineered to DB2 database designs via the BACHMAN/DBA™ for DB2 to create optimized DDL for production. To enhance system performance, Access Based Design information from the process model is provided to the database administrator for reference during the DB2 design process. The first support for code generation will be via the BACHMAN/Designer™ for CSP. Analyst specifications will be transferred as ESF to the IBM Cross System Product.

Support

BACHMAN provides a four day course to introduce the BACHMAN/Analyst product to systems analysts, data analysts, designers, and programmers. It covers the development, maintenance, and enhancement of application systems. During the course, students are introduced to the basics of data, process, and logic modeling, why each is important and how the BACHMAN/Analyst supports the integration of these models. The course has a 40 percent laboratories, 60 percent lecture content.

The following services are provided as part of the maintenance contract:

- BACHMAN technical support representatives are available by phone to answer any questions about BACHMAN products. They can be reached at (617) 273-9003, between 8:30am and 7pm EST.
- Customers have access to an electronic bulletin board to which they can send questions, comments, and suggestions to BACHMAN 24 hours a day, seven days a week. Customers will receive prompt replies from BACHMAN support representatives.

Technical Requirements

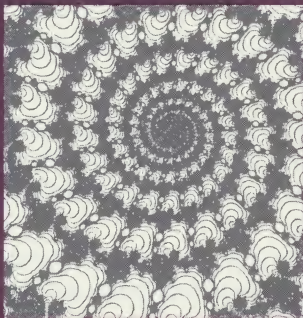
	Minimum	Recommended
Processor:	Intel™ 80386 or 80486	Clock speed of 20MHz or faster
Memory:	12 Megabytes	More for big designs
Storage device:	115Mb fixed disk	
Printer:	Any printer supported by OS/2 EE	300 dot-per-inch printer or a plotter for diagram graphics
Displays:	VGA color or monochrome	VGA resolution (640x480) or better
Other hardware:	2-button mouse	
Operating system:	OS/2 EE V1.2 or 1.3	

Note: all devices must be supported by OS/2 EE V1.2 or 1.3

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BACHMAN /Analyst



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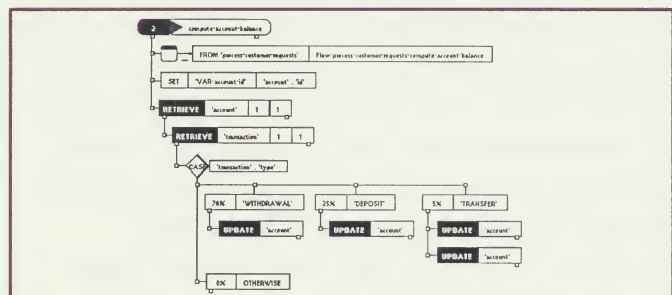
BACHMAN

For more than software. For business.

The BACHMAN/Analyst™ provides an integrated environment for defining models encompassing data and process specifications, as well as business logic. Business specialists and MIS professionals communicate via a common blueprint—rich enough to be understood by non-technical users and precise enough to make software. Business specifications can be kept current to reflect fully the changing nature of the enterprise, yet can be independent of the technology of the target environment. Analysts can develop a library of reusable definitions and descriptions to improve productivity significantly. Modeling and re-engineering tasks are supported by the powerful BACHMAN Expert Advisor, to benefit both the novice and the experienced analyst.

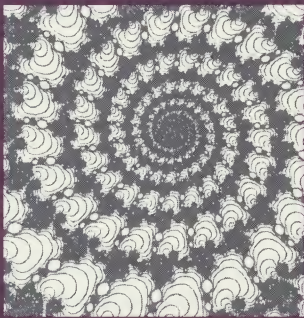
Highlights

- Helps the systems analyst and data analyst to build and document fully specified process models and normalized data models.
- Provides, through the Process Specification Diagram (PSD), the ability both to describe the details of business processes and to meet the needs of the programmer for a functionally complete graphic specification.
- Supports new DB2 application design and maintenance, as well as migration to DB2 from other environments: CA-IDMS, IMS, VSAM files, and any COBOL-like structure.
- Provides Access Based Design information for the database administrator, to aid in the design of production-quality database designs.
- Integrates with the BACHMAN/DA Link™ products to capture data models from ADW™, IEW™, and Excelerator™, for production in DB2.
- Supports the productive exchange of information with other CASE tools, by providing import and export utilities.
- Allows project teams to leverage their work by providing specification reuse capabilities.
- Supports shared work by partitioning models through keywords.
- Has a SAA and CUA-compliant user interface for ease of training.
- Fully exploits OS/2 EE V1.2 or 1.3 Data Manager and Presentation Manager.



The Process Specification Diagram (PSD) is understandable to both business specialists and MIS professionals.

BACHMAN /Designer for CSP



BACHMAN helps companies meet the challenge of mounting competitive pressures and exploit the opportunities of advances in information technology. With the BACHMAN/Designer for CSP and the BACHMAN/Re-Engineering Product Set™ as a whole, MIS professionals can create and maintain complete, semantically correct data, process, and logic specifications, as well as optimized database designs and applications. The resulting systems are of production-quality, are easy to build and maintain, comply fully with IBM standards, and provide superior performance to end users.

BACHMAN

For more than software. For business.

The BACHMAN/Designer™ for CSP allows MIS professionals to generate better quality, high performance DB2 applications with the IBM Cross System Product (CSP). Applications are generated and maintained from BACHMAN/Analyst™ models.

Highlights

- Generates CSP designs in external source format (ESF) from BACHMAN/Analyst specifications and from BACHMAN/DBA for DB2 designs.
- Provides easy development and maintenance of models and documentation for CSP with the BACHMAN/Analyst.
- Takes advantage of the logically complete business specifications from the BACHMAN/Analyst.
- Takes advantage of the optimized DB2 designs created in the BACHMAN/DBA for DB2.
- Translates BACHMAN's Process Specification Diagram DML (Select, Insert, Update, Delete) to SQL DML which reflects the optimized DB2 designs.

Product Overview

The BACHMAN/Designer for CSP is a workstation product running under OS/2 EE, Version 1.2. It is a design tool for IBM's Cross System Product V3.3, permitting models from the BACHMAN/Analyst and DB2 designs from the BACHMAN/DBA for DB2 to describe applications in external source format (ESF). CSP accepts the ESF output and generates CSP code for compiling application programs.

The close integration of the BACHMAN/Analyst and the BACHMAN/DBA for DB2 enables analysts to produce specifications for optimized CSP/DB2 systems within AD/Cycle.

With the BACHMAN/Analyst, the systems analyst creates a clear and complete picture of business logic in the form of a unified data and process model. The specifications describing applications are functionally complete at the logical level. This permits CSP systems to be defined and maintained as models within the BACHMAN/Analyst. The applications defined by these specifications are readily comprehensible in the form of diagrams, because they are free of CSP implementation details.

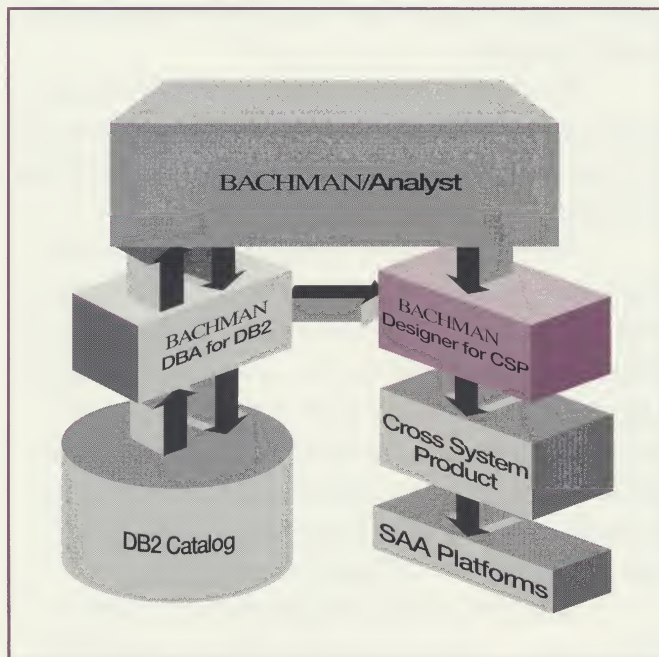
In the BACHMAN/Designer for CSP, the user works through a series of interactive dialogs to select the target environment and user interface. The BACHMAN/Designer for CSP will then structure the design according

to the runtime environment, and generate application definitions in ESF.

The BACHMAN/Designer for CSP exploits design information passed from the BACHMAN/Analyst and from the BACHMAN/DBA for DB2. Because the ESF code is based on models already validated for CSP in the Analyst, and on DB2 designs optimized for performance, the ESF output will run as a CSP application without syntactic or semantic errors. The product also uses DB2 design information to generate SQL statements which correctly reflect DB2 structures, without requiring the programmer to enter them in CSP.

Integration of the BACHMAN/Designer for CSP with the BACHMAN/Analyst extends the use of Cross System Product by allowing users to develop applications within a modeling environment. Systems are designed and maintained at the specification level. With the BACHMAN/Designer for CSP, models and documentation for CSP are easily maintained, and are brought into the mainstream of the application development task.

Prerequisites for using the BACHMAN/Designer for CSP are the BACHMAN/Analyst and the BACHMAN/DBA for DB2.



The BACHMAN/Designer for CSP is an integral part of the IBM AD/Cycle solution.

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Other brand names, company names, and product names are the trademarks and registered trademarks of their respective companies and are included for identification purposes only.

Support

BACHMAN provides a two day course introducing the BACHMAN/Designer for CSP to analysts, designers, and programmers. It covers development, maintenance, and enhancement of CSP application systems using BACHMAN products. During the course, students are introduced to how BACHMAN products support the translation of models to CSP applications. The course has a 40 percent laboratories, 60 percent lecture content. Training on CSP and the course for the BACHMAN/Analyst are prerequisites.

The following services are provided as part of the maintenance contract:

- BACHMAN technical support representatives are available by phone to answer any questions about BACHMAN products.
- Customers have access to an electronic bulletin board to which they can send questions, comments, and suggestions to BACHMAN 24 hours a day, seven days a week. Customers will receive prompt replies from BACHMAN support representatives.

Technical Requirements

	Minimum	Recommended
Processor:	Intel™ 80386 or 80486	Clock speed of 20MHz or faster
Memory:	12 Megabytes	
Storage device:	115Mb fixed disk	
Printer:	Any printer supported by OS/2 EE	300 dot-per-inch printer or a plotter for diagram graphics
Displays:	VGA color or monochrome	VGA resolution (640x480) or better
Other hardware:	2-button mouse	
Operating system:	OS/2 EE V1.2 or 1.3	

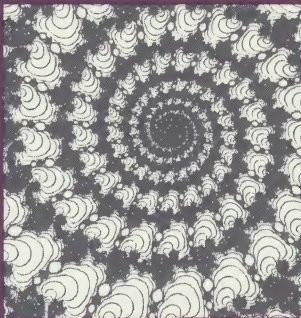
Note: all devices must be supported by OS/2 EE V.1.2 or 1.3

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OS05/91BCSP/BIS9134

BACHMAN/Analyst Capture



BACHMAN helps companies meet the challenge of mounting competitive pressures and exploit the opportunities of advances in information technology. With the BACHMAN capture products and the BACHMAN/Re-Engineering Product Set™ as a whole, MIS professionals can create and maintain complete, semantically correct data, process, and logic specifications, as well as optimized database designs and applications. The resulting systems are of production-quality, are easy to build and maintain, comply fully with IBM standards, and provide superior performance to end users.

BACHMAN

For more than software. For business.

The BACHMAN/Analyst Capture products, combined with the BACHMAN/Analyst™ capture existing database descriptions and provide a clear, comprehensive view of current systems in the form of implementation-independent data models. As a result, MIS can analyze existing structures prior to migration to DB2 systems. In fact, BACHMAN capture products, combined with the BACHMAN/Analyst and the BACHMAN/Database Administrator™ for DB2, facilitate the enhancement and migration of existing designs to high quality DB2 designs.

The BACHMAN capture products can be used to capture existing database descriptions (DBDs) from IMS, or data descriptions (01s) written in COBOL or PL/1. Up-to-date data models and new systems can be developed based on existing data structures—even with poor quality or missing documentation.

Highlights

BACHMAN/Analyst Capture for IMS

- Translates IMS database descriptions (DBDs) into an implementation-independent data model, enabling migration to DB2 tables.
- Includes and works with BACHMAN/Analyst Capture for COBOL product to create entities that accurately reflect the entire IMS database structure.
- Captures all IMS data structures required for a complete representation of IMS designs.
- Represents relationships based on key dependencies.
- Supports "fast path" database designs.
- Maintains mappings between the original IMS file objects and their counterparts in the data model.
- Complies with CUA standards and is NLS-enabled.

BACHMAN/Analyst Capture for COBOL

- Translates COBOL data descriptions (01s) into an implementation-independent data model.
- Reduces effort required to exploit advanced data modeling capabilities of BACHMAN/Analyst working on translated structures.
- Maintains mappings between the original COBOL file objects and their counterparts in the data model.

BACHMAN/DA Capture for PL/1

- Translates PL/1 identifiers and data descriptions into COBOL-like structures that are readily converted by the BACHMAN/Analyst Capture for COBOL product.
- Facilitates migration of IMS designs written in PL/1 to DB2 tables.
- Maintains mappings between the original objects and their counterparts in the data model.

Product Overview

The BACHMAN/Analyst Capture products run under OS/2 EE, Version 1.2 or Version 1.3. They are complemented by the BACHMAN/DA Capture for PL/1, which operates in a DOS window under Presentation Manager.

The BACHMAN/Analyst Capture for IMS includes the BACHMAN/Analyst Capture for COBOL product. Together, they read existing IMS DBDs and COBOL data descriptions, thereby capturing database designs from IMS applications into the BACHMAN/Analyst. Data structures are converted to BACHMAN entity-relationship diagrams that can be used to view, analyze, update, and incorporate an existing model into an enterprise model.

In combination with the BACHMAN/Analyst and the BACHMAN/DBA for DB2, the BACHMAN/Analyst Capture for IMS enables the migration of data structures from IMS to the DB2 environment, thereby utilizing the MIS department's investment in existing IMS databases. Maps are retained between new designs and the original IMS segments.

The BACHMAN/Analyst Capture for COBOL produces similar results with the capture and reverse engineering of existing file designs in the form of COBOL 01s. When used with the BACHMAN/Analyst and the BACHMAN/DBA for DB2, the BACHMAN/Analyst Capture for COBOL allows for the migration of data structures from VSAM and sequential files to DB2-based applications.

The BACHMAN/DA Capture for PL/1 provides

capabilities for translating identifiers and data descriptions written in PL/1 into COBOL-like structures. The BACHMAN/DA Capture for PL/1 is a DOS product used with the BACHMAN/Analyst Capture for COBOL product. PL/1 structures are captured and reverse engineered into entity-relationship data model diagrams.

All of the BACHMAN capture products have been designed to minimize editing of files prior to translation and capture. The capture log file in each product helps users resolve problems and prevent errors of omission by recording, depending on the capture product in use:

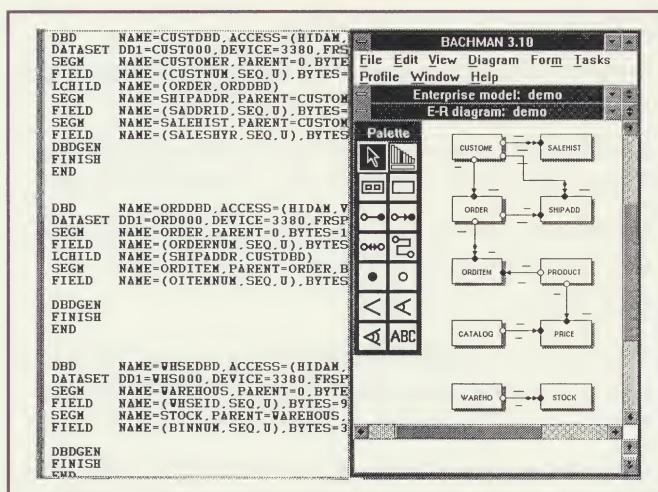
- 1) instances of statement types captured, as well as those that have been ignored,
- 2) whether any errors were encountered,
- 3) whether any data model objects were referenced, but omitted from the capture process, and
- 4) how many data model objects were created or merged.

During translation, the capture products create a map for the data model object created to show its corresponding object in the original code.

Further information and in-depth literature about BACHMAN products is available. Call **1-800-BACHMAN**.

Technical Requirements

	Minimum	Recommended
Processor:	Intel™ 80386 or 80486	Clock speed of 20MHz or faster
Memory:	12 Megabytes	
Storage device:	115Mb fixed disk	
Printer:	Any printer supported by OS/2 EE	300 dot-per-inch printer or a plotter for diagram graphics
Displays:	VGA color or monochrome	VGA resolution (640x480) or better
Other hardware:	2-button mouse	
Operating system:	OS/2 EE V1.2 or V1.3	



The BACHMAN capture products facilitate transfer of existing data descriptions to easy-to-read, meaningful, graphic data models.

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